

Smoke Monitoring



United States
Department of
Agriculture

Forest Service
Air Program

CONTACTS: JIM RUSSELL (503) 808-2956, TRENT PROCTER (559) 784-1500, JANICE PETERSON (425) 744-3425

FEBRUARY, 2006

Background

Reducing fuels while preventing smoke impacts to neighboring communities is a big challenge for National Forest managers. Smoke can be hazardous to human health, contribute to regulatory violations, and foul scenic vistas. Many fire dependant ecosystems have complex terrain and meteorology, clean air, and small, tourist-dependent communities that complicate efforts to use wildland fire and prescribed burns for land management and restoration. Air Program staff help Forest managers understand air quality regulations, monitoring technology, dispersion modeling, emissions estimation and reduction techniques, and burn alternative trade-offs.

Successes

Okanogan-Wenatchee Smoke Monitoring Network:

The Pacific Northwest Air Program, Fire Program, Okanogan-Wenatchee National Forest, and Washington Department of Ecology designed, funded and implemented a smoke monitoring network in five local communities. The Okanogan-Wenatchee National Forest has used network data to self-restrict permitted burns, resolve a Washington Department of Ecology violation notice for nuisance smoke, and assess relative impacts of other regional pollution sources (**Fig 1**). Network data also tests BlueSky, a sophisticated smoke dispersion model developed by the Forest Service Pacific Northwest Forestry Sciences Laboratory.

Southern Sierra WFU Smoke Monitoring: Using smoke/fine particle monitoring and webcams, the Forest Service California Region Air Program assisted Sequoia-Kings Canyon National Park and the Sequoia and Sierra national forests in 11,500 acres of Wildland Fire Use in 2005. To rectify PM₁₀ non-attainment, the San Joaquin Valley Air Pollution Control District allowed zero violations through November 2005; they were therefore concerned about National Forest and Park plans for a series of fall Wildland Fire Use ignitions. Dedicated webcams combined with real-time (<http://www.satguard.com/USFS/default.asp>) monitoring data (**Fig 2**) allowed the Forest and National Park services to achieve their goals and the Air Pollution Control District to reach PM₁₀ attainment status.

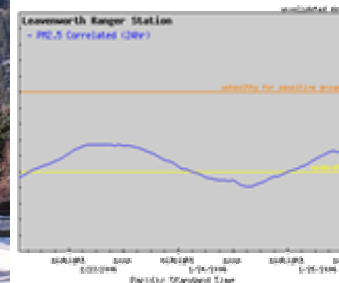


Fig 1. Air Program monitoring in rural Washington communities helps protect the public from smoke and explain Fire Program impacts on local air quality.

Goals

- Provide managers real-time information on smoke impacts to both use fire and protect public health.
- Facilitate state smoke permitting.
- Distinguish prescribed fire air-quality impacts from other local sources.
- Distinguish nuisance from hazardous smoke levels.
- Improve public awareness of smoke concentrations during wildfires.
- Mitigate the Chief's threats (Fire & Fuels, Invasive Species, Unmanaged Recreation) by maximizing fire use to reduce excess fuels and restore fire-dependent ecosystems, thereby reducing catastrophic fire, pests and pathogens, and protecting biodiversity, recreation, and air quality.

Challenges

New air quality regulations to improve visibility in Class I areas and tighten fine particulate matter health standards shorten burn windows and increase planning time to use fire as a management tool. Smoke monitoring and modeling improvements are needed to better protect public health. Cooperative funding arrangements between the Air and Fire and Aviation Program would ensure that the Air Program has sufficient staff and resources to assist the Agency in meeting these challenges.

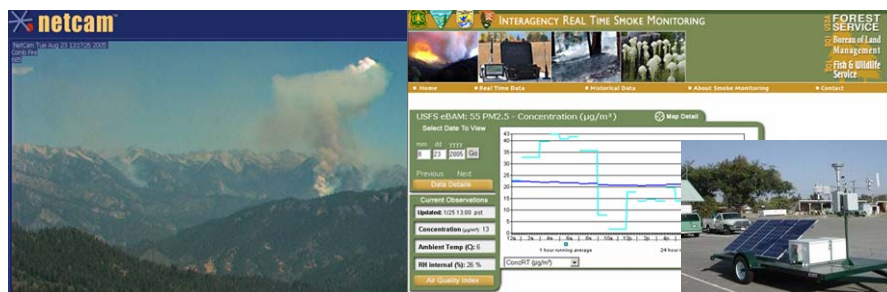


Fig 2. Six second webcam photos show smoke transport in the San Joaquin Valley District. A co-located portable E-Bam sampler transmits matching real-time data via the Internet.